Unless someone like you cares a whole awful lot, nothing is going to get better. It's Not.
- Dr. Seuss, The Lorax

UNIT 1
THE BIG CLIMATE CHANGE EXPERIMENT
Lesson 2: The Influence of Climate on Culture

Unit 1 Guiding Question

Does the world's rising temperature affect me?

A NOTE FROM THE HOT AUTHORS

The Hot: One World, One Climate curriculum and simulation is a collaborative effort among secondary teachers, educational experts and journalists with faculty and staff from the NASA Goddard Institute for Space Studies (GISS) and the Columbia University Earth Institute. This interdisciplinary team – known as The GISS Climate Education Advisory Group – has been able to draw on many perspectives and areas of expertise to advance a real world, problem-based approach for student learning around many climate change topics.

The curriculum is designed to reinforce academic knowledge and skills outlined in national education standards with an eye toward student inquiry and research-like experiences. While exploring the science and stories of climate change, our goal is for students to use scientific research to build science and climate literacy, evaluate climate change solutions and develop 21st Century skills for informed civic engagement.

Our development process has been an iterative. The Climate Change in the Classroom (CCIC) Teacher Workshop at NASA GISS/Columbia University is a continuation of this process as we broaden the Hot collaboration to include the review, critique and recommendations more scientists and educators from 5 U.S. states.

It is important to note that we are in the active stage of review and development of the Hot curriculum and simulation. Hence, the materials being field-tested in the CCIC are not in their final form and require additional educational and scientific review. This is one of the major goals of the CCIC Teacher Workshop.

We hope that the Hot curriculum and simulation will prove to be a meaningful way for you and your students to engage in learning about Earth, and the intersections of science and society in the context of an important global issue – climate change. We also hope Hot is personally relevant students, and motivates a lifetime of interest and critical thinking about our planet and the special role humans have in the Earth system.

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UNIT 1 AT-A-GLANCE

Students engage in lessons where they develop some basic background knowledge about climate change drawing on research from scientists around the world. They will begin to develop key ideas that climate change is happening, we can observe it and it is a global problem. Students also begin to understand some of the lines of climate change evidence. More fundamentally, Unit 1 explores the relationship between climate and life, and helps students explain the difference between weather and climate.

Summative Assessment

Write a short news story using initial understandings developed in Unit 1 to describe the roles of humans and carbon in Earth's climate change story. The essay should accurately relate and explain at least one key climate science concept (e.g., difference between weather and climate) as well as 3 or more lines of climate change evidence. It should also express the influence of these roles in terms of time and spatial scale relevant to the climate change story.

National Education Standards Addressed

Learning objectives for each lesson relate to national education standards found in the Common Core State Standards (CCSS) and Next Generation Science Standards (NGSS). Each lesson identifies the specific standards addressed.

Unit 1 Learning Progression

Following input received from the 2013 Climate Change in the Classroom Teacher workshop, we will prepare a learning progression for the Unit. In its final form it will provide a short introduction and a lesson grid with brief summaries of student activities, learning objectives, standards addressed and performance assessments.

EXPLORE

1.2 The Influence of Climate on Culture

TIME: 45-60 minutes or 1 class period + homework

"Our climate has influenced where we have built our cities, where we plant our crops, how we travel, what we eat and sometimes, how we die."
- Climate Change: Picturing the Science

overview

Students explore and compare some of the ways climate influences life and culture in different regions through global stories and images.

subjects

Earth & Environmental Science, Language Arts, Social Studies

objectives

The student will be able to…

- identify 3-5 climate characteristics of climate in a specific region
- compare and contrast the influence of climate on culture in two regions
- illustrate the effects of local/regional climate on a culture through a short comic or essay

standards

NGES ESS3.A Natural Resources
Resource availability has guided the development of human society

CCSS ELA Literacy
Critically read informational text and use diverse media (RI.1-3, 7)

Write to support claims and examine a topic (W.1-2)

prerequisite

None

key vocabulary

Adaptation: The action of changing based on changing circumstances.
Climate: The average weather patterns common to an area or region over an extended period of time.
Culture: The learned behavior of a society or a subgroup (as defined by Margaret Mead).
Diversity: To be composed of different types of things – people, plans, customs, beliefs animals etc.
Environmental: Relating to the human impact on the natural world
Fossil Fuel: A fuel like coal, oil or gas formed from the carbon-base remains of past life.
Livelihood: What someone does to secure essential things (food, water, shelter, clothing etc.) – usually used in reference to a kind of work.
Terrestrial: Defining characteristics of the land like mountains, plants, wetlands, etc.

resources / materials

Computers with Internet access

LCD Projector with ability to stream video

World Map see "National Geographic's Map Maker resource" for teachers at http://goo.gl/xbiyN

World Wildlife Foundation online videos, "Stories of Climate Change and Climate Action" http://goo.gl/S5CRO

Copies of attached CULTURE & CLIMATE ANALYST Learning Experience Organizer (LEO).

differentiation guide

This lesson differentiates content, process, product based on student readiness, interests and learning profile. To be completed…

background

Throughout human history, climate has played a major role in shaping life and culture on our planet. Climate is described by several factors that make up the usual conditions found in a place throughout the year - how wet, dry, cold, hot, windy, humid, and the composition, density, and pressure of the air. These factors are closely related to the features of the physical landscape in an area and its location on Earth.

Climate also produces the amazing environmental diversity found around Earth. These include: tropical rainforests in Brazil, arctic regions in Russia, arid deserts in Egypt and temperate mid-Atlantic cities in the U.S. Distinct cultures emerged from these climate conditions. So, the climate people experience varies depending on where we live and influences how people live, what they do for a living, their development and even their level of prosperity.

In large part, this is because climate determines the variability and availability of natural resources people depend on like food, water and energy, as well as the weather. Just think about the United States. The Atlantic hurricane season affects people on the East coast, but mostly southern states. In Alaska ice fishing is a staple of life. Warm, sunny and humid conditions in Iowa are ideal for producing their famous corn. Vacationers and retirees seeking year-round warmth often head to Arizona. There is a certain comfort in knowing what weather to expect in the region - when to expect it, for how long (duration), over what period (frequency) and what characteristics it should have (intensity, amount, level).

Throughout human history, climate has played a major role in life and culture. Now that there are 7 billion people living on our increasingly crowded planet, the impact of humanity is so large that today people are able to influence global climate. Our massive presence on the planet leaves us at a unique moment in time when our actions have a larger impact on the climate than nature.

Here are three big questions to think about: How does climate affect us? How does our culture affect the climate? How might we change our culture to reduce our impact on climate?

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suggested procedure

1. Ask students what comes to mind when you think of the influence of climate on culture. They can use words, phrases, and/or images and explain the sources for this knowledge.

2. Screen the video "Climate Witness-Marlene Rocha, Brazil" (3:39 minutes) - http://goo.gl/5Mo04 - or read the text of Marlene's story to the class.

3. Ask students to identify and describe characteristics of climate and culture where Marlene lives in Brazil. *Suggested prompts:* Where is the Brazilian Amazon located on the world map? What are some of the usual weather conditions throughout the year? What are some other physical features of the region? What are aspects of life and culture for people who live in Marlene's region? How do people adapt to the climate? Exchange ideas about connections between climate and culture. Model answering these questions on the "Culture & Climate Analyst" Learning Experience Organizer (LEO) for this lesson.

4. Working individually or in pairs, students may select one of the three following regional climate witness stories and their associated scientific review. The stories can either be printed out or read on the Internet. Students record their observations about the region using the "Culture & Climate Analyst" Learning Experience Organizer (LEO). This LEO allows students to describe and analyze how changing climate conditions and cultural characteristics might impact regional cultures. Students are also encouraged to do an Internet search for additional information on the region to enhance their observations.

   Gung Qui Lai Jai, China - http://goo.gl/1E0b0
   Nola Royce, New York - http://goo.gl/8JrqB
   Jerome Robles, Malaysia - http://goo.gl/VRcmm

EXTENSION: For teachers interested in an extended analysis of Culture & Climate consider using the "Culture & Climate Analyst" Learning Experience Organizer (LEO) while students listen to *This American Life* Episode #495 – "Hot in My Backyard" – Act I: The CO_2 in CO (18 minutes) at http://goo.gl/w9zqX.

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wrap-up and discussion

Students who read each of the climate stories, then form small groups for a Pair/Share activity to compare and contrast the different global region's culture and climate connections.

assessment

Each student prepares a 300-500-word essay or a 6-panel comic strip describing ways climate influences global life and reflecting on the introductory quote to the lesson. The essay or comic should accurately use at least 3 of the words from the vocabulary list and provide examples from at least 1 of the Climate Witness Stories as support. Students may use any of the following online comic generator tools to support their work: Comic Life, Kerpoof, Comicssketch, Comics Lab/Extreme, PikiStrips, Toondoo, Bubblr, Comiqs, My Comic Book Creator, BitStrips, ReadWriteThink's Comic Creator, Make Beliefs Comix, Myths & Legends Story Creator, Cartoonist, Pixton, Chogger.

feedback

The authors of Hot value your thoughts and feedback on this curriculum. Please feel free to send us any suggestions or share anything your students found particularly interesting or engaging.

Comments can be sent to cah40@columbia.edu

STUDENT PAGE: LESSON 1.2 THE INFLUENCE OF CLIMATE ON CULTURE

CLIMATE & CULTURE ANALYST

Name: _____

Date: _____

MAGARET MEAD
Cultural Anthropologist,
Writer – USA 1901-1978

The **CLIMATE & CULTURE ANALYST'S** job is to focus on the effect of climate on the culture of an area of the world. Climate variables include weather patterns like temperature, precipitation and wind as well as physical (aka terrestrial) features like mountains, lakes, and vegetation that are linked with the regions' climate. Use this Learning Experience Organizer (LEO) to reflect on the impact of cultural characteristics – like work, home, education, food, water, sports, power supplies, and education, on climate. If you are interested in learning more about your region, do utilize the internet for additional information.

Please be prepared to share your ideas and hypotheses with your group.

PLEASE MAKE A DOT ON THE LOCATION OF YOUR CLIMATE STORY:

CLIMATE VARAIBLE	"NORMAL" CLIMATE CONDITION	NOTICIBLE CHANGE (Δ) IN CLIMATE CONDITION	THE Δ'S IMPACT ON CULTURE
☐ TEMPERATURE ☐ WIND ☐ AQUATIC ☐ TERRESTRIAL ☐ OTHER			
☐ TEMPERATURE ☐ WIND ☐ AQUATIC ☐ TERRESTRIAL ☐ OTHER			
☐ TEMPERATURE ☐ WIND ☐ AQUATIC ☐ TERRESTRIAL ☐ OTHER			

"Our humanity rests upon a series of learned behaviors, woven together into patterns that are infinitely fragile and never directly inherited." – **Margaret Mead**